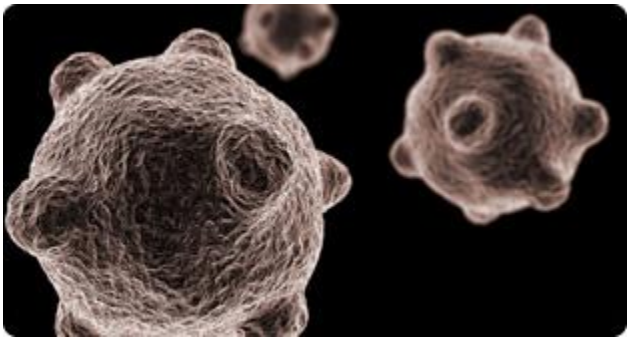
Norovirus Prevention Guidance for Institutions/Facilities



Virginia Department of Health

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VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

Norovirus Prevention Guidance For Institutions/Facilities

Summary
In recent years there has been increased awareness of the impact of norovirus as an agent of gastrointestinal illness. In an effort to support institutions and facilities (e.g., hospitals, long-term care facilities such as nursing homes, prisons, etc.) the following detailed guidance has been developed. It contains basic information concerning norovirus, as well as recommendations to reduce the risk of outbreaks or mitigate the impact of an outbreak through pre-planning, as well as detailed information about actions to take if an outbreak occurs. In addition to this document, consult with local health departments as needed to guide planning. During an outbreak, contact the local health department to identify facility-specific strategies that may be implemented.

Background

Illness

Infection with norovirus usually causes illness 12-48 hours after exposure, but can appear as early as 10 hours after exposure. Although infection with norovirus is not usually serious, people may feel very sick. Symptoms often include nausea, vomiting, diarrhea, and stomach cramping. Sometimes people have a low-grade fever, chills, headache, muscle aches, and a general sense of tiredness. The illness is usually brief, with symptoms lasting only one or two days. Most people have no long-term health effects from the illness. However, the very young, the elderly, and persons with weakened immune systems may be unable to drink enough liquids to replace what they lose from vomiting and diarrhea, causing dehydration that may require medical intervention. Outbreaks may also be very disruptive to facility operations, and affect resident and staff safety.

There are no specific medications for treating norovirus infection; norovirus infection does not respond to antibiotics. By drinking fluids, such as juice or water, people can reduce their chance of becoming dehydrated. Sports drinks are not significantly better at replacing nutrients and minerals lost during this illness.

Transmission

Noroviruses can spread easily and quickly from person to person. The virus is found in the stool and vomit of infected people. People can become infected when the virus enters their mouth by eating or drinking contaminated food or liquids or by touching their mouth after touching surfaces or objects contaminated with norovirus or after having direct contact with another person who is infected without first washing their hands.

People infected with norovirus are contagious from the moment they begin feeling ill. While symptoms usually last 1-3 days, infected people will shed the virus in their stool for an average of 28 days. However, infected people do not become long-term carriers of norovirus.

Anyone can become infected with these viruses. Because there are many different strains of norovirus, norovirus infection and illness can occur more than once during a person's lifetime. There is no vaccine for norovirus. Therefore, preventing infection and transmission is critical to reducing the impact of this virus.

Prevention (Pre-Outbreak Planning)

The following recommendations may assist facilities in reducing the risk of an outbreak of norovirus occurring, or may enhance the response should an outbreak occur:

1. **Provide information to staff and residents (e.g., in-services, notices, posters, etc.) to re-enforce facility policy regarding hygiene.** In particular, focus on the need for frequent handwashing with warm water and soap. Although handwashing is preferred for norovirus control, alcohol-based hand sanitizers (≥70% ethanol concentration) may be considered when soap and water are not readily available and hands are not visibly dirty. Ensure adequate access to handwashing stations and supplies (e.g., soap, paper towels), and provide and encourage use of hand sanitizer stations in both work and public areas.

2. **Ensure that a clear, fair, safe policy on workers with illness is in place, and identify and remove barriers to absence due to illness.** A liberal/non-punitive sick leave policy that addresses the needs of sick personnel and facility staffing should be in place. A contingency staffing plan should be developed that identifies the minimum staffing needs and prioritizes critical and non-essential services based on residents' health status, functional limitations, disabilities, and essential facility operations. This should recognize the problem of reduced staff availability **combined with** increased patient/resident care needs that can occur during a norovirus outbreak.

3. **Develop and institute basic surveillance for gastrointestinal infection in patients/residents and staff to more rapidly identify illness and outbreaks.** A system may need to be developed to monitor and record illness among patients/residents and staff routinely. This provides a baseline for illness and helps to identify potential cases or increases in disease activity that may indicate an outbreak. Data should be reviewed periodically. A specific case definition for norovirus might be:

   > Vomiting and/or diarrhea (two or more loose stools in a 24-hour period) in a resident or staff member and whose symptoms have no other apparent cause.

   In general, an outbreak of gastroenteritis in a facility is defined as the presence of more diarrhea or vomiting than would usually be expected in the facility, or in a particular unit, for that time of year. A basic threshold for norovirus might be three or more cases of illness among residents and/or staff within a 72-hour period.

   Laboratory testing and confirmation can provide important information about the causative agent. However, the cause of an outbreak is likely to be due to norovirus when:

   - o Stools are negative for bacterial pathogens
   - o The average incubation period is 12-48 hours
   - o The average duration of illness is 1-3 days
   - o Vomiting occurs in at least 50% of cases

Surveillance should also incorporate a system for collecting and handling specimens from potential cases (residents or staff) - consult with the local health department to determine appropriate testing options for specimens.

4. **Review facility cleaning guidelines and identify potential gaps.** Observe routine housekeeping procedures to identify cross contamination issues (e.g., using the same cloth to clean bathroom surfaces and wiping down ice buckets). Correct deficiencies when found and share the information with other managers to standardize optimal cleaning methods.

   Identify high risk surfaces (e.g., with frequent hand contact, high risk of exposure to fecal matter or vomitus, food preparation surfaces, common medical equipment, etc.) and a reasonable cleaning frequency for the facility. Ensure that equipment is available and working properly. Determine if water temperatures (e.g., for dishwashers) are adequate for norovirus disinfection (note that care should be used in adjusting facility hot water temperatures – any increase to temperatures that may injure staff/patients/residents should be considered carefully).

   Engineering controls and practices may take some time to consider and change – therefore, preparation is important. An example is considering the installation of auto-dispensing paper towel dispensers in public restrooms, employee restrooms, kitchens, and locker rooms. Another example of a potential source of infection that is not often considered is "community" ice machines in nursing areas and nurses stations. Individuals who scoop out ice may use items such as glasses, buckets, cups, etc. – individuals may even store personal drinks, etc. directly in the ice. These practices may be a source of contamination with norovirus and this equipment can be difficult to clean – therefore, these practices should be prohibited. Employees must properly wash their hands prior to filling containers - a separate hand sink should be provided for employees to wash their hands. This sink should be in the same area where containers are filled and the ice is added to the containers. Do not allow any sick person to fill or handle water containers. Ice must be dispensed with an ice scoop (without coming in direct human contact). To prevent direct hand contact with the ice, it is recommended that employees wear disposal gloves. Facilities may wish to consider using closed, gravity-fed machines to eliminate direct access to the ice by staff.
   Potentially contaminated materials, such as ice buckets or water jugs, should be cleaned and sanitized at least once every 24 hours. This includes washing with an appropriate detergent in the first compartment of a three-compartment sink, rinsing clean with water in the second compartment, and sanitizing with an approved agent in the third compartment by immersing for one minute. The compartments of the sink should be of sufficient size to allow immersion of the container. For containers too large to be immersed in the three-compartment sink, a clean and sanitize in-place procedure can be used. This includes use of a clean bucket and wash cloth for the detergent cleaning step, followed by rinsing the container at least three times with water, and finally, spraying the inside with a sanitizer solution. Provide an area to allow proper air drying of items. Empty containers for water or ice should not be stored on the floor at any time.

   If an establishment is not capable of following these guidelines for the cleaning of water containers, it is recommended that bottled water be provided during an outbreak

Any refillable soap/detergent/hand sanitizer dispensers should be filled in an area free of environmental contaminants such as dust and insects. The dispenser should not be placed on the floor while filling. The dispenser should be filled in a room with smooth, dry, easily cleanable floors, walls, and ceilings, and should be kept away from chemical storage or other contaminants.

Note that, while this guidance provides some details for cleaning/disinfection related to norovirus, particularly for intermediate-level disinfection of non-critical surfaces, other levels of disinfection or sterilization may be needed within any given facility. Consult the Centers for Disease Control and Prevention Guideline for Disinfection and Sterilization in Healthcare Facilities (2008) available at www.premierinc.com/quality-safety/tools-services/safety/topics/guidelines/downloads/Disinfection_Nov_2008.pdf as needed.

5. **Plan for promptly acquiring additional resources (e.g., signs and other educational material, hand sanitizer, cleaning supplies, personal protective equipment).** Recognize the increased need for support (e.g., increased waste management) as well as the increased consumption of some materials (e.g., paper towels and toilet paper in restrooms). Estimate the quantities of essential materials and equipment (e.g., masks, gloves, hand hygiene products, IV fluids, etc.) that would be needed during an outbreak. Develop plans to stockpile adequate supplies and to address supply shortages, including strategies for using normal and alternative channels for procuring critical resources.

   Of note, although Virginia does not have specific regulations excluding or limiting the concentrations of chemical germicides disposed of through the sewer system, the safe disposal of chemicals is important to minimize environmental harm. Plans to manage the release of potentially toxic substances could include: 1) switching to alternative products, 2) collecting the disinfectant and disposing of it as a hazardous chemical, or 3) using a commercially available small-scale treatment method (e.g., neutralize glutaraldehyde with glycine). Guidance may be obtained through the Virginia Department of Environmental Quality (see http://www.deq.virginia.gov/p2/vh2e/resources.html).

6. **Identify specific individuals to form a multidisciplinary planning committee or team to provide guidance and to respond to potential cases or outbreaks.** Individuals may include:

   - Facility administration
   - Medical director
   - Nursing administration
   - Infection control
   - Occupational health
   - Staff training and orientation
   - Engineering/maintenance services
   - Environmental (housekeeping) services
   - Dietary (food) services
   - Pharmacy services

- Laboratory personnel
- Occupational/rehabilitation/physical therapy services
- Transportation services
- Purchasing agent
- Facility staff representative
- Other member(s) as appropriate (e.g., local health department personnel, clergy, community representatives, department heads, resident and family representatives, risk managers, quality improvement, direct care staff, collective bargaining agreement union representatives).

The planning committee should designate specific individuals to manage communications (e.g., for family, visitors, media), inter-facility coordination (e.g., for diverting new admissions), training and education of staff, and staffing needs in the event of an outbreak.

7. **Ensure that contact information for the local health department and other key healthcare partners are readily available.** Information on local health departments is available at http://www.vdh.virginia.gov/lhd/ - post the district health department phone number in a visible location in the facility to aid in reporting a cluster of illness. **By law, any cluster of illness must be reported by physicians and directors of facilities licensed by the Commonwealth to the local health department immediately.**

Management of Case/Outbreak

In the event that a suspected case or outbreak of norovirus does occur in a facility, the following actions may help to reduce the impact.

1. **Contact the Local Health Department.** Although individual cases of norovirus are not reportable to the health department, physicians and directors of healthcare facilities are required to report outbreaks (including norovirus outbreaks) to the local health department (Regulations for Disease Reporting, 12 VAC 5-90-80). The local health department can provide specific guidance to facilities to assist in identifying the cause of illness and necessary measures to limit the spread of disease and stop the outbreak as soon as possible. Contact information for local health departments is available at www.vdh.virginia.gov/lhd/

2. **Provide information to patients/residents and family/guests** on the signs and symptoms, the mode of transmission, methods for preventing norovirus (including proper handwashing), and how to report illness. All visitors and relatives should be made aware of the outbreak and asked to cooperate with the infection control procedures. Signs may be posted at the entrance of the facility, on the door of affected resident's room and/or on the toilet designated for use by affected residents (see Additional Resources, below). Request that family/guests who are ill defer visiting for at least 72 hours after diarrhea and vomiting ceases.

3. **It may be prudent to discontinue all new admissions and/or visitation to the facility until the outbreak is over.** If visitation is allowed, visitors should go directly to the person they are visiting and not spend time with anyone else. Visitors should wash their hands upon entering and leaving the room.

4. **Isolate ill residents from others** (until at least 24 hours after their last symptoms). Group ill people together if possible. Unwell residents should not use shared lounges and meal areas; confinement of ill individuals to rooms may be necessary. Generally, well residents may be allowed to continue normal daily activities - discontinue activities where ill and well residents would be together. Group activities should be kept to a minimum or postponed until the outbreak is over. Residents should not be moved from an affected to an unaffected unit/ward/floor.

   If unwell residents must share a room with others, then strict hand hygiene procedures should be in place for staff, residents, and visitors and separate toilet facilities should be allocated for the affected residents.

   Asymptomatic individuals who might not reliably tend to their hygiene (e.g., those with cognitive impairment) may also need to be confined to their rooms to control the spread of norovirus. In some situations, confinement of all individuals may be necessary if other control measures have not been or may not be effective.

   Note that restriction of activities may not need to be absolute to be effective - individuals should be able to engage in necessary activities (e.g., discharge from facility if otherwise

indicated, receiving medical care, attending court hearings) if physically capable. This would require evaluation on a case-by-case basis, as well as appropriate communication with others (e.g., family, healthcare professional, court) to minimize the risk of spread.

To encourage compliance, consider providing basic supplies, such as fluids (hot tea, water, electrolyte maintenance solutions such as Pedialyte®) and foods such as crackers, dry toast, and/or broth to ill individuals. Provide a mechanism for patients/residents to get items (newspapers, magazines, light snacks, over-the-counter medications, etc.) without leaving their rooms.

If there are transfers out of the facility during the outbreak, notify the receiving facility of the situation so that appropriate precautions may be taken.

5. **Implement active surveillance (e.g., daily symptom logs) for staff and patients/residents to identify new cases early, and to identify potential lapses in control measures.** Surveillance logs for patients/residents should include information such as the patient/resident name, room/floor/wing, date of illness onset, signs/symptoms of illness, duration of illness, treatment (including hospitalization) and outcome, and specimen collection and results. Staff surveillance should include the above, as well as the specific onset date/time of diarrhea or vomiting, and job duties. A sample log is included in the attachments to this document.

6. **Consider the need to collect appropriate clinical specimens from some symptomatic staff and patients/residents for laboratory analysis.** Consult with local health department staff as soon as possible to determine the appropriate number of specimens to collect, the specimen collection methods, testing options, and arrange for transport (if testing is indicated).

   Basic instructions for collecting specimens include:

   1. Collect an unpreserved stool specimen in a clean, dry container (filling at least half way) during the first 48 hours of illness. Please note: Testing of vomitus for norovirus generally cannot be done. Of note, viral excretion is greatest during the phase of illness where stools are liquid or semi solid, but virus may be detected in formed stool. Staff should wear appropriate personal protective equipment when collecting specimens. If a spatula is used to collect stool (e.g., from a bedpan or diaper/incontinence pad) plastic should be used rather than wood.
   2. Label each specimen container with the patient's first name, last name, date of collection, and the name of the facility. Testing may not be performed if the specimen container is improperly labeled or if the submission form is incomplete.
   3. Indicate the facility name on the container. Numerous norovirus outbreaks may be under investigation within a single geographic area and the facility name is used to track the specimen and to direct appropriate reporting. The health department may give you an outbreak identifier to include on the form as well.
   4. Individual containers should be verified as being leak proof and then enclosed in a plastic bag. Testing will NOT be done on specimens that leak while in transit to the Division of Consolidated Laboratory Services.

5. Specimens for norovirus testing should be refrigerated (not frozen) after collection.
6. The entire collection of specimens should be bagged in plastic and placed in a padded, insulated box with refrigerant packs for shipment.

Note: in consultation with the local health department, determine if stool specimens also need to be collected in Cary Blair enteric transport medium (pink liquid) in order to test for other pathogens (e.g., *Salmonella*, *Shigella*, *Campylobacter*). Specimens collected in Cary Blair transport medium should be maintained at room temperature; DO NOT ship specimens in Cary Blair on ice.

When possible, specimens from approximately **six** separate cases are preferred to ensure adequate identification of the causative agent in an outbreak. Contact local health department staff for additional guidance on specimen collection and submission.

7. **Staff who develop symptoms at work should go home immediately - ill staff should report their illness to their supervisors, and should remain out of work until at least 24 hours after diarrhea and/or vomiting cease; staff who have food service or direct patient care duties should be reassigned until at least 48 hours after symptoms cease.** On returning to work, staff who have recently been ill may be given different duties, if possible, to further reduce the risk of transmission. It should be recommended, but not required, that employees seek medical care for their illnesses.

   Testing for norovirus is not required before staff return to work; however, the need for good hand hygiene should be stressed to returning staff, since an individual can shed norovirus for an average of 28 days following infection.

8. **Reinforce that only catering staff should have access to the kitchen during the outbreak.**

9. **Minimize the flow of staff between sick and well residents.** Staff should be assigned to work with either well residents or sick residents, but should not care for both groups. Staff who go back and forth between ill and well residents can play a major role in transmitting the virus from resident to resident.

   In addition, limit the number of staff 'floating' to different wards as much as possible to decrease the chance of infection spreading to other floors or wards.

   Staff who have been in contact with infected persons should not prepare or serve food – instead, food should be prepared and provided by dedicated servers or non-direct patient care healthcare workers.

10. **Staff should wash their hands (or use alcohol-based hand sanitizer) when entering and leaving *every* patient/resident room.**

    Staff may be further directed to perform hand hygiene at the following times:
    - Particular intervals (e.g., once per hour)
    - Upon entering a kitchen
    - After using the restroom

- After shaking hands or other physical contact with peers and guests
- After sneezing
- After touching the face
- After blowing the nose
- After rubbings hands on clothing and similar activities
- After handling raw foods
- After handling dirty kitchen utensils and kitchenware
- After cleaning, sweeping, or mopping
- After a break
- After smoking, eating, or drinking
- Before handling any food, especially ready-to-eat foods and ice
  Note: gloves should be worn when handling food – bare hands should not contact exposed, ready-to-eat foods. However, thorough handwashing is also important in keeping gloves or other utensils from becoming vehicles for transferring microbes to the food.
- Prior to handling or administering any oral medications (e.g., pills)
- After changing diapers
- After handling other potentially contaminated objects

Employee hand hygiene compliance should be monitored and enforced – this may require active management through direct observation, reminders, and correction.

11. **Staff should wear clean clothing daily and change soiled clothing as soon as possible.**

12. **Patients with suspected norovirus infection should be managed using Standard Precautions, with careful attention to hand hygiene practices.** However, Contact Precautions should be used when caring for diapered or incontinent persons, during outbreaks, and when a splash could occur.

    Therefore, staff or visitors should generally wear gloves and gowns when caring for ill patients/residents or when touching potentially contaminated surfaces. A surgical (procedure) mask with eye-shield should be worn if there is the possibility of contact with vomiting patients/residents or splashes that could aerosolize infective material.

    Change gowns and gloves between contacts with roommates. Remove gloves and then the gown, perform hand hygiene, and then remove mask before exiting the patient/resident's room. Ensure that hands and clothes do not touch potentially contaminated environmental surfaces or items in the resident's room, such as bed rails and tables. If gloves or hands are visibly soiled with feces or vomitus, wash hands with soap and water. Alcohol-based hand gels (≥70% ethanol concentration) may be used if gloves or hands have not been visibly soiled and if soap and water are not readily available.

    Adequate stocks of PPE should be provided and should be easily accessible.

13. **Temporarily remove unnecessary items that may be potential sources of transmission (e.g., candy dishes, fruit baskets).**

14. **Review cleaning and disinfection methods carefully.** Due to the large quantities of virus (millions of virions/gram of stool) shed by norovirus-infected individuals combined with the extremely small infectious dose (less than 100 particles) required for infection, as well as the ability of norovirus to survive for prolonged periods (hours to days) on environmental surfaces, maximum virucidal activity is generally desirable to effectively control outbreaks. Facilities should make decisions related to materials that seek to balance issues of efficacy, cost, convenience, frequency of application, toxicity/safety, and availability. In addition, improper disinfection of environmental surfaces contaminated may play a role in the spread of noroviruses in some settings.

    Cleaning
    For any visibly contaminated surfaces, cleaning is necessary to remove foreign material from objects – this is normally accomplished using water with detergents or enzymatic products. Thorough cleaning is necessary since organic matter (e.g., feces, vomitus) can interfere with the antimicrobial activity of disinfectants. In addition, reducing the number of microorganisms that must be inactivated through cleaning increases the margin of safety when a germicide is used according to the labeling and shortens the exposure time required to kill the entire microbial load.

    Disinfection
    A disinfectant should be used on all surfaces that are touched regularly. Restroom surfaces, such as faucet handles, soap dispensers, stall doors and latches, toilet seats and handles, and towel dispensers are heavily contaminated surfaces and require frequent disinfection. Other surfaces to consider may include food preparation surfaces, self-service utensil handles, sinks, faucets, drinking fountains, tables, chairs, counters, commodes, bedside tables, door handles and latches, push plates, railings, elevator buttons, thermostats, telephones, alarm clock buttons, keyboards, carts, chairs (including backs), bed rails, hand rails, light switches, curtain pull rods, ice machines, vending machine keyboards, pens, pencils, games, sports equipment, medical equipment (e.g., blood pressure cuffs), privacy curtains, etc.

    Regardless of whether a detergent or disinfectant is used on surfaces in a healthcare facility, surfaces should be cleaned routinely and when dirty or soiled to provide an aesthetically pleasing environment and to prevent potentially contaminated objects from serving as a source for healthcare–associated infections.

    a) **An effective disinfectant is a freshly-prepared dilute unscented bleach solution.** Various sources (e.g., Centers for Disease Control and Prevention, Food and Drug Administration [FDA], etc) may have different recommended concentrations; the ideal concentration is unknown. For hard, non-porous, environmental surfaces, the CDC recommends a minimum concentration of 1,000 ppm (generally a dilution 1 part unscented household bleach solution to 50 parts water) with a contact time of one minute. However, hypochlorite is substantially and quickly inactivated in the presence of organic matter. Therefore, in areas with high levels of soiling and resistant surfaces, up

to 5,000 ppm chlorine bleach (1 part household bleach solution to 9 parts water) and a contact time of up to 10 minutes may be necessary. Since these concentrations are much higher than is allowed for a no-rinse food contact surface sanitizer according to the FDA Food Code, if the area is a food contact area this disinfection procedure must be followed by a clear-water rinse and a final wipe down with a sanitizing bleach solution (i.e., 200 ppm sodium hypochlorite = 0.5% chlorine bleach = one tablespoon bleach to one gallon of water) to remove residual high levels of bleach.

For disinfecting, use an unopened bottle of unscented chlorine bleach. Prepare a dilution of fresh bleach every day of use and discard unused portions. Open bottles of concentrated chlorine will lose effectiveness after 30 days – therefore, change bottles of bleach every 30 days for accurate concentrations.

Do NOT mix bleach with other cleaning agents (e.g., acids such as vinegar, or ammonia such as Windex®) - potential irritants released from such mixtures are chlorine gas, chloramines, and ammonia gas.

Since chlorine bleach may impact fabrics and other surfaces, spot test an area to be cleaned before applying to visible surface. Use only in well-ventilated areas.

b) **Alternatives to bleach**: The reliability of disinfectants other than those containing chlorine to kill norovirus is uncertain. However, due to the limitations of bleach solutions (e.g., respiratory irritation, damage of some materials) additional disinfection options are desirable. In an effort to provide some guidance to manufacturers and the public on effectiveness of disinfecting agents for norovirus, the U.S. Environmental Protection Agency (EPA) does allow for testing of virucidal effectiveness using a closely related virus, Feline Calicivirus Virus (FCV), as a surrogate for effectiveness against norovirus. A list of

How to Mix and Use Bleach Solutions

Household bleach is made of 5.25% sodium hypochlorite (52,500 ppm); therefore, a 1% bleach solution is 525 ppm. One tablespoon (= 15 milliliters = 0.5 liquid ounce) of concentrated bleach per gallon of water at normal room temperature is considered to be the equivalent of 200 ppm (roughly 0.5% bleach solution). Some experiments have shown that 200 ppm (or even less) will inactivate many viruses. This is the concentration that is generally used for cleaning food preparation surfaces.

So, although 0.5% may be adequate for general surface decontamination a 10% dilution may be necessary for inactivation of norovirus. A 10% solution corresponds to one part bleach to nine parts water (e.g., 1 3/4 cups of household bleach per gallon of water).

Open bottles of concentrated chlorine will lose effectiveness after 30 days. Change bottles of bleach every 30 days for accurate concentrations. For disinfecting, use an unopened bottle of chlorine bleach. **Prepare a dilution of fresh bleach every day of use and discard unused portions.**

Note: "Ultra" concentrations of bleach contain 6-7.35% hypochlorite and are not recommended to avoid producing higher than intended concentrations of chlorine.
Note: Only unscented bleach should be used for disinfection purposes, especially for on food contact surfaces, since there is no information on whether the chemicals which produce the scent are food safe.

Adapted from: www.allqa.com/ChlorineSanitizing.htm and www.cdc.gov/ncidod/diseases/hanta/hps/noframes/bleach.htm

agents, current as of June 2008, that have been found to meet the EPA's effectiveness against FCV is available at: www.epa.gov/oppad001/list_g_norovirus.pdf

Materials using 75% ethanol (e.g., alcohol swabs) may be effective. However, ethanol is highly flammable and should not be used for disinfection of large surface areas except under specific circumstances.

It should be noted that some studies have shown that some quaternary ammonium products are not fully effective against FCV, and the CDC states that "most quaternary ammonium compounds….do not have significant activity against [norovirus]." However, several quaternary ammonium products have been labeled as effective against FCV by the EPA. Therefore, at the present time, the precise role of quaternary ammonium products in controlling norovirus is unclear.

EPA-approved disinfectants should be used according to manufacturers' instructions – **note that contact times required vary by agent, and may require up to 10 minutes for maximal viral inactivation**. Users should read labels carefully to ensure the correct product is selected for the intended use and applied efficiently. By law, users must follow all applicable label instructions for EPA-registered products. Ideally, product users should consider and use products that have a shortened contact time.

These chemicals can be dangerous; even products listed as non-toxic may still cause mild eye and/or skin irritation in some people. **Follow all safety instructions.** Employers are responsible for informing workers about the chemical hazards in the workplace and implementing control measures - Material Safety Data Sheets (MSDS) for each chemical or mixture of chemicals must be readily available to employees who work with the products to which they could be exposed. Consult product labels (available at http://oaspub.epa.gov/pestlabl/ppls.home by entering the EPA number) and product representatives for specific details on use.

Note: The Virginia Department of Health (VDH) does not endorse or recommend any particular product or manufacturer. VDH is unable to independently verify the claims of effectiveness for any particular product. These products vary in their cost, contact time needed, ability to clean and sanitize/disinfect, and shelf life. Each product must be used in accordance with the manufacturer's instructions and state/local regulations, and appropriate training and personal protective equipment must be provided to staff before they are used. If you have questions or concerns about the use of a particular product, please contact the Environmental Health Specialist assigned to your facility.

Of note, chemical disinfection can cause toxic side effects for the patient due to chemical residues on the instrument or object; occupational exposure to toxic chemicals; recontamination by rinsing the disinfectant with microbially contaminated water; and potential damage to surfaces/objects. As a result, some instruments and equipment may be safer to disinfect by heat (i.e., pasteurization) rather than by chemicals. The duration of treatment depends partly on temperature and method used: the time-temperature relation for hot-water pasteurization is generally ~70°C (158°F) for 30 minutes. Review manufacturer guidance on cleaning/disinfection as needed.

General Cleaning/Disinfection

Housekeeping staff should wear gloves, as well as masks, when cleaning potentially contaminated surfaces. If gloves or hands are visibly soiled with feces or vomitus or potentially contaminated cleaning solution, wash hands with soap and water. Alcohol-based hand gels (≥70% ethanol concentration) may be used if gloves or hands have not been visibly soiled and if soap and water are not readily available.

During general cleaning/disinfection, water-disinfectant mixtures should be changed regularly (e.g., after every three to four rooms, at no longer than 60-minute intervals) or if there is a gross spill or the surface is contaminated with visible blood or body fluids so that the cleaning procedure does not spread norovirus throughout the environment.

Mops and reusable cleaning cloths should be handled using disposable gloves and gown. These should be adequately cleaned and disinfected regularly (e.g., after every three to four rooms at no longer than 60-minute intervals, or if there is a gross spill or the surface is contaminated with visible blood or body fluids). Immersing cleaning cloths in dilute bleach solution (5,000 ppm) for two minutes is likely to be adequate; disinfection with a phenolic may be less effective. Standard laundering (e.g., detergent washing followed by drying at 80ºC for 2 hours) may provide acceptable decontamination of heavily contaminated mop heads - frequent laundering of mops (e.g., daily) is recommended. Microfiber mops may be preferable to cloth/string mops. Single-use disposable towels impregnated with a disinfectant also can be used for low-level disinfection when spot-cleaning of noncritical surfaces is needed.

Body Fluid Spills

The process for cleaning body fluids potentially contaminated with norovirus (e.g., feces) should consist of:

A. Wear a disposable mask, gloves (environmental cleaning using a more concentrated disinfectant may require a heavier duty glove than a simple non-sterile latex/vinyl glove), eye-shield, and plastic disposable apron. Disposable shoe covers may also be considered.
B. Use paper towels to soak up excess liquid. Transfer these and any solid matter directly into a plastic bag.
C. Clean the soiled area with detergent and hot water, using a disposable cloth.
D. Disinfect the contaminated area with a disinfecting agent.
E. Dispose of apron and cloths into a plastic waste bag. Dispose of single-use gloves and eye-shields into the waste bag; if used, contain re-usable personal protective equipment (e.g., gloves) in a plastic bag for cleaning.
F. Remove mask and dispose into the waste bag.
G. Seal the waste bag.
H. Wash hands thoroughly using soap and water for at least one minute and then dry them thoroughly.
I. Wear disposable gloves and place the waste bag into another plastic bag and seal. Place the bag containing the re-usable personal protective equipment (if applicable) into another plastic bag and seal.

J. Wash hands thoroughly using soap and water for at least one minute and then dry them thoroughly.
K. Dispose of the waste bag. Deliver the re-usable personal protective equipment (if applicable) to the appropriate area for cleaning according to manufacturer's recommendations.

Vomit should also be treated as potentially infectious material and should be immediately covered with a disposable cloth, and doused with a disinfectant to reduce potential airborne contamination. All individuals in the immediate area of the vomiting incident should be cleared from the area before clean-up begins. Cleaning staff should use face masks with eye protection or face shield, gloves, and aprons when cleaning up after a vomiting incident. Paper toweling or other toweling used to clean-up liquid vomit should be immediately placed in a sealed trash bag and disposed of properly. Then use the cleaning procedures as for fecal contamination. Following cleaning/disinfection, keep the area closed for at least one hour. Any uncovered food in the vicinity must be discarded.

Dishes/Utensils

The use of disposable dishes and utensils is **not** necessary; regular dish and utensil washing practices should effectively remove any pathogens. However, air drying of dishes is preferable to towel drying.

Disinfectant Sprays/Fogging

Disinfectant spray-fog techniques for antimicrobial control are unsatisfactory methods of decontaminating air and surfaces – this is not recommended for general infection control in routine patient-care areas.

Floors

Cleaning procedures that increase the aerosolization of norovirus, such as dry vacuuming carpets or buffing hard surface floors, should **not** be utilized. Clean hard surfaces with detergent and hot water, followed by disinfection. Contaminated carpets should be managed in a three step process: 1) clean with carpet detergent and hot water, 2) disinfect by applying an appropriate disinfectant, if available, and 3) steam clean (158°F for five minutes or 212°F for one minute is needed for complete inactivation). Using an appropriate virucidal agent in the reservoir for the steam cleaning solution may be considered.

Note: Remove bags from all recently used vacuum cleaners; sanitize the vacuum bags with a virucidal disinfectant and then replace the bags with HEPA filter bags before subsequent use.

It should be noted that the use of a disinfectant on floors is debatable. Floors may become contaminated with norovirus from settling particulates; by contact with shoes, wheels, and other objects; and occasionally by spills. During cleaning, water/detergent becomes contaminated if a disinfectant is not used – this leads to seeding the patient's environment and potential infection. In addition, since environmental surfaces close to the patient and in outpatient settings can be contaminated these surfaces should be disinfected on a regular

schedule. By using a single product throughout the facility (for both floors and other environmental surfaces) training and appropriate practice are simplified. However, using a detergent alone on floors may be justifiable because norovirus contamination likely contributes only a limited amount to transmission.

Contaminated Linen and Bed Curtains

Linen and bed curtains should be handled with disposable gloves and gown and carefully placed directly into laundry bags (to prevent generating aerosols) and washed separately in hot water and detergent for a complete wash cycle – ideally as a half load for best dilution.

15. **Air currents should be minimized:** air currents generated by open windows, fans, or air conditioning can disperse aerosols widely.

16. **Provide regular updates to employees**, including:

    - The status of the outbreak
    - The current response measures
    - Talking points to be used in dealing with patients/residents and families
    - Reminders on proper handwashing
    - The importance of staying home while ill
    - Procedures for identifying and for reporting illness

17. **The necessary duration of preventive measures to adequately control an outbreak of norovirus is not well-defined.** A general guideline would be at least two incubation periods (i.e., four days) from the onset of the last case. However, some individuals may shed norovirus for weeks. Therefore, continued surveillance for new cases should continue for at least two weeks to enable a rapid response.

18. **Following the resolution of a norovirus outbreak, conduct an after-action review to identify strengths and weaknesses of the response.** Use this opportunity to identify areas that may be improved on for future outbreaks.

19. **Alert Emergency Medical Services (EMS) to the potential for exposure, and appropriate precautions to take, if patient transport is required.** This may include guidance on the use of contact precautions (i.e., disposable gowns; gloves and hand hygiene; mask if actively vomiting patient). In addition, EMS staff should consider appropriate infection control issues, such as disinfection of equipment (e.g., gurneys, stethoscopes) – this not only reduces their risk of illness, but the risk of transmission to other patients.

Additional Resources

For additional information on norovirus, please visit the following websites:

Information on norovirus, including frequently asked questions:
Centers for Disease Control and Prevention
http://www.cdc.gov/ncidod/dvrd/revb/gastro/norovirus.htm

Virginia Department of Health Norovirus Factsheet
http://www.vdh.virginia.gov/epidemiology/factsheets/norovirus.htm

Centers for Disease Control and Prevention Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008
www.premierinc.com/quality-safety/tools-services/safety/topics/guidelines/downloads/Disinfection_Nov_2008.pdf

INFECTION CONTROL MEASURES: CHECK SHEET

HAVE YOU?

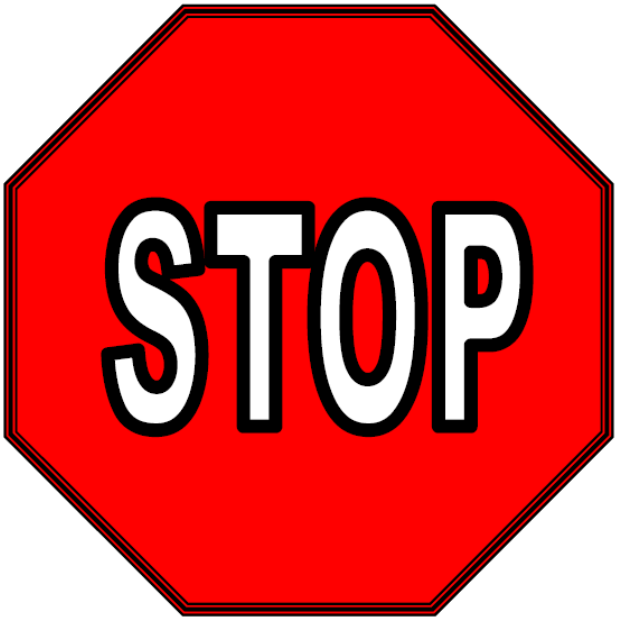
- ☐ Informed all **staff, visitors and residents** of the situation and what they need to do?
- ☐ Ensured **all staff with symptoms are excluded from work** until at least 24 hours after resolution of symptoms, and at least 48 hours for food handling or direct patient care?
- ☐ Allocated **dedicated staff** to care for unwell residents, whenever possible?
- ☐ Provided all staff with **information and training** in Infection Control Precautions?
- ☐ Ensured that all residents have their **hands washed** after going to the toilet, before meals and after any episode of diarrhea or vomiting?
- ☐ **Separated well residents** from unwell residents, wherever possible, for at least 24 hours after resolution of symptoms?
- ☐ **Avoided transferring** residents to other institutions while cases of gastroenteritis are occurring, or, if a transfer is necessary, ensured receiving institution has been **notified** of the outbreak?
- ☐ Whenever possible, **restrict admissions** of new residents until gastroenteritis cases have resolved?
- ☐ Considered **posting signs** at appropriate locations throughout the facility?
- ☐ Asked **visitors who report any symptoms** to avoid visiting till 72 hours after symptoms cease?
- ☐ Ensured all staff and visitors **wash their hands** before and after all resident contact?
- ☐ Ensured **sufficient soap and/or alcohol based hand rubs or gels**, and hand-drying facilities are available?
- ☐ Provided sufficient **gloves, gowns, aprons, masks, goggles, face shields** and ensured that they are easily accessible?
- ☐ Ensured **cleaning and other relevant staff** are aware of the correct **cleaning procedures** and the importance of handwashing?
- ☐ Ensured **catering staff** are aware of the precautions required in **food service** area and the importance of handwashing?
- ☐ Ensured all staff are aware of the precautions required when handling **soiled linen**?
- ☐ Ensured **laundry staff** are aware of the correct **laundering procedures** and the importance of handwashing?

ATTENTION VISITORS!!!

We presently have a number of ill residents. Please wash your hands before visiting and before leaving. You may wish to reconsider visiting at this time.

If you have any questions please contact either the Administrator _____ or the Director of Nursing _____.

Thank you



Hand washing is the single most important practice to prevent the spread of outbreaks!

HANDS MUST BE WASHED:

- Whenever they are visibly soiled or there has been contact with stool.
- Between contact with different residents.
- Before putting on gloves *and* after removing gloves.
- After using the toilet.
- Before eating or smoking.
- Before handling or preparing food.

A PROPER HAND WASH INCLUDES:

- Using warm running water and soap with plenty of friction for 30 seconds.
- Using a clean paper towel to dry your hands and to turn off the tap.

Use of a waterless hand sanitizer may be substituted for handwashing if adequate sink facilities are not immediately accessible and hands are not visibly soiled.

GASTROENTERITIS

VISITOR INFORMATION SHEET

BACKGROUND

Cases of infectious diarrhea have occurred recently in this facility. We have implemented the recommendations provided by the Virginia Department of Health in order to control any further spread of the disease.

INFECTION CONTROL MEASURES

Staff have put several measures in place to minimize the impact, including:

- Special cleaning in some areas
- The use of gloves and gowns for caring for residents
- Restricting some activities of affected residents
- Special staffing allocation
- Education.

The illness is self-limiting but in the meantime we are asking for your assistance to help us control and prevent further spread of the illness. You can help by **WASHING HANDS BEFORE AND AFTER VISITING.**

This should be done in the following manner:

- Wash hands for a minimum of 20 seconds
- Ensure all surfaces of the hands are thoroughly washed
- Use the soap provided
- Thoroughly rinse hands under running water
- Pat hands dry with paper towel, then discard
- Turn the taps off with a fresh paper towel, then discard.

If hands are not visibly soiled, using alcohol-based hand sanitizer is also effective.

IF YOU DEVELOP SYMPTOMS OF ILLNESS we ask that you do not visit until 72 hours after your illness ends.

We appreciate your concern and cooperation regarding this problem; please feel free to discuss any questions that you may have with our staff.

How to Sanitize

1. Put on disposable gloves, mask, and gown, and wear eye protection.

2. Fill a clean container with 1 gallon of water.

3. Mix 1 cup of 5.25% unscented bleach with 9 cups of water. (This makes a 5,000 ppm sodium hypochlorite solution.)

4. Before using bleach solution, wipe off all surfaces. Use disposable towels to remove any vomit, stool, or other substances like food or grease.

5. Apply bleach solution to surface area and allow it to remain wet for 10 minutes. If possible, allow bleach solution to air dry.

6. Dispose of all soiled paper towels and personal protective equipment in a plastic trash bag and place in garbage.

Table of Sample Bleach Dilutions

Dilution Goal	Bleach (52,500 ppm NaOH)	Water	Approx Solution Concentration (ppm)	Actual Solution Concentration (ppm)	Approx Final % Hypochlorite*	Approx Final Vol
1:250	1 part	250 parts	200	209	0.02%	N/A
	1 tbl (0.5 oz)	1 gallon		207		1 gallon
1:200	1 part	200 parts	250	261	0.03%	N/A
1:100	1 part	100 parts	500	520	0.05%	N/A
1:64	1 part	64 parts	800	808	0.08%	N/A
	1/4 cup	1 gallon		818		1 gallon
1:50	1 part	50 parts	1,000	1,029	0.10%	N/A
	1/3 cup	1 gallon		1,087		1 gallon
	80 ml	4 liters		1,029		1 gallon
1:49	1 part	49 parts		1,050		N/A
1:25	1 part	25 parts	2,400	2,019	0.26%	N/A
	3/4 cup (6 oz)	1 gallon		2,379		1 gallon
	5 tsp	1 pint		2,636		1 pint
	3 tbl	1 quart		2,383		1 quart
1:10	1 part	10 part	5,000	4,772	0.50%	N/A
1:9	1 part	9 part	5,000	5,250	0.50%	N/A
	1 3/4 cups	1 gallon		5,235		1 gallon
	1 2/3 cups (13 oz)	1 gallon		5,008		1 gallon
	1 cup	9 cups		5,250		2 quarts
	5 tsp	1 cup		4,953		1 cup
	3.5 tbl (1.75 oz)	1 pint		5,245		1 pint

Notes: Unscented 5.25% (52,500 ppm) sodium hypochlorite (bleach) - change bottles of bleach every 30 days for accurate concentrations. For disinfecting, use an unopened bottle of chlorine bleach. **Prepare a dilution of fresh bleach every day of use and discard unused portions.**

"Actual Solution Concentration" = [(bleach concentration ppm)(volume of bleach)]/[(volume bleach)+(vol water)]

Conversions:					
1 cup = 8.1 oz = 240 mL = 240 cc	1 gallon (US) = 128 oz = 3.785 L = 15.8 cups	1 teaspoon (tsp) = 5 mL	1 tablespoon (tbl) = 3 teaspoon (tsp) = 15 mL	1 quart = 32 oz = 0.946352946 L	1 pint = 16 oz ~ 473 mL

Sample Gastroenteritis Case Log

Facility: Total residents ill: Total residents (ill and well):
Date: Total staff ill: Total staff (ill and well):

Identification		Case Information				Location/ Duties		Onset	Signs and Symptoms											Tests	Outcome		
Resident or staff with gastroenteritis **Resident or staff name**		Age (Years)	Sex (M/F)	Cognitively Impaired (Y/N)	Resident (R) or Staff (S)	Location (Bldg, Room)	Staff Duties (use code below)	Vomiting or diarrhea onset date MM/DD/YYY	Nausea (Y/N/DK)	Vomiting (Y/N/DK)	Diarrhea (Y/N/DK)	Cramps (Y/N/DK)	Passing excess gas (Y/N/DK)	Headache (Y/N/DK)	Muscle aches(Y/N/DK)	Unusual fatigue (Y/N/DK)	Fever (Y/N/DK)	Chills (Y/N/DK)	Blood in stool (Y/N/DK)	Stool for PCR, culture, O&P; other	V or D duration (Hours)	Hospitalized (Y/N)	Died (Y/N)
Last	**First**																						
Totals:		M = F =			R = S =																		

*Duty codes: F – Food Service H – Housekeeping P – Patient Care A – Administrative/clerical M - Maintenance